



Illinois Department of Transportation

Memorandum

To: ALL BRIDGE DESIGNERS 05.5

From: Ralph E. Anderson *Ralph E. Anderson*

Subject: Deck Beams with Wearing Surface and Type SM Railing

Date: October 28, 2005

This memorandum provides new details for fascia deck beams with an initial reinforced concrete wearing surface and a Type SM Steel Bridge Railing. Fabricators have encountered difficulties tying all of the inserts and reinforcement in the proper places and both fabricators and contractors have requested alternatives to the current fascia beam curb. Our goal was to provide new details which are more fabrication and construction friendly while maintaining the crash tested status of the Type SM railing.

Attached are revised Figures 2.3.28 and 2.3.29 which replace the same figures in the Prestressed Concrete Manual. They will be incorporated on the next manual update. The following is a summary of the significant changes:

1. The curb section on the fascia beams was eliminated. The reinforced concrete wearing surface shall be poured out to out of deck by the contractor.
2. The concrete strength of the wearing surface has been increased to 5000 psi and has been reflected in Guide Bridge Special Provision 34.
3. The top rail anchorage has been changed to a fixed location from the top of the beam as opposed to varying with the profile grade.
4. The D(E) bar has been reconfigured for a better fit.
5. The a(E) bars in the wearing surface are hooked at each end for better development.
6. Notes addressing the wearing surface placement and formwork requirements have been added to the details. These notes shall be included in the contract plans.
7. Further guidance was provided for the calculation of "Y" (wearing surface thickness) and how to present on the plans.

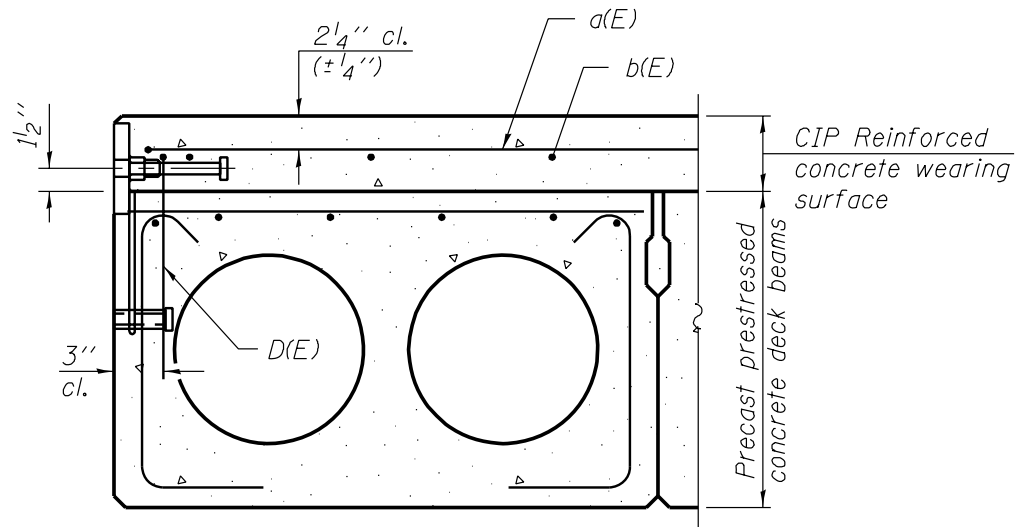
In addition, the current R-34 base sheet was revised and renamed R-34BWS and a new base sheet R-34CWS was developed. These sheets detail the "Type SM - Steel Bridge Rail Side Mounted" with bituminous wearing surface and with concrete wearing surface. The following is a summary of the significant changes:

1. Added the permissible ranges of wearing surface thicknesses to the bottom of each sheet.
2. Added a plate to the top connection at the rail anchorage which supports the spacer and removed the tack welds on the spacer from the post. The tack weld was also removed from the lower spacer to post connection.
3. The asphalt paint option was removed at the lower rail post to beam connection. A 1/8" fabric pad is detailed as the only option.

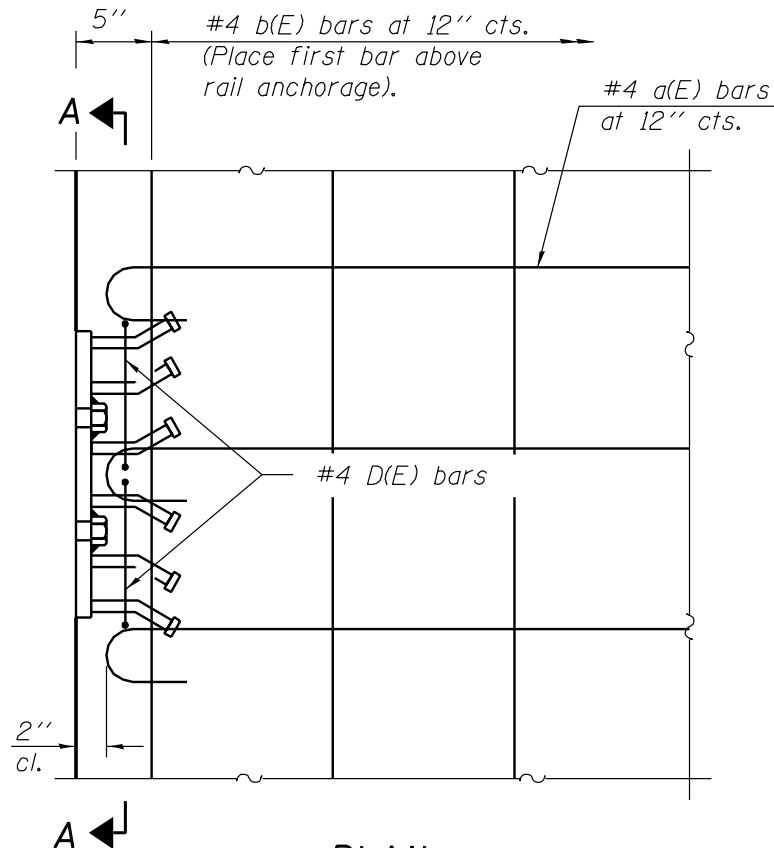
The Type SM railing is a TL-4 crash tested railing provided it is used within the design parameters stated on the base sheets. It is possible to maintain the crash tested status of the railing with larger wearing surface profiles however this would require variable rail anchorage locations, among other changes, which is difficult to fabricate properly.

The new details may be found in the Detail Cell Library and the new base sheets dated 10-28-05 may be found in the MicroStation v8 Superstructure library, both on the IDOT web site. Additionally, the revised GBSP 34 (Concrete Wearing Surface) is also available on the IDOT website. Designers are encouraged to implement these new details on all applicable projects which have not been let; however, all applicable projects beginning with the March 10, 2006 letting shall utilize these new details and special provision.

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CROSS SECTION



PLAN

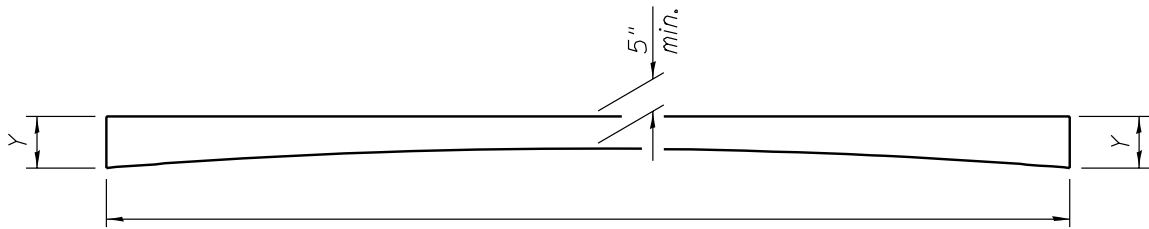
Notes:

The rail anchorage shall be cast with the beam and the wearing surface shall be cast in the field. Formwork necessary for the wearing surface may be secured utilizing the bottom rail anchorage inserts and/or additional inserts cast into the beam. Drilling into the beam will not be permitted.

See Fig. 2.3.29 for Section A-A.

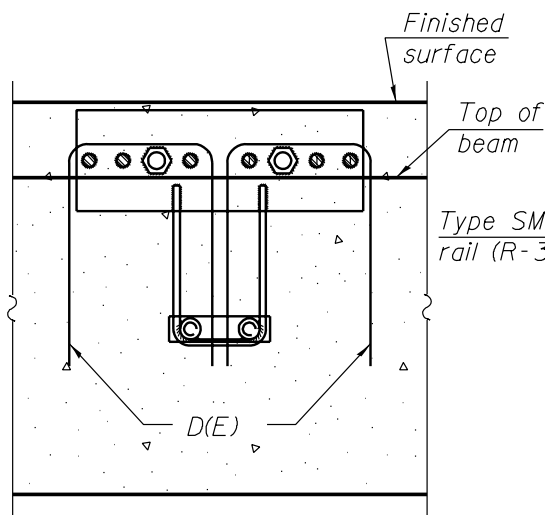
REINFORCED CONCRETE WEARING SURFACE AND RAILING CONNECTION DETAILS

Figure 2.3.28

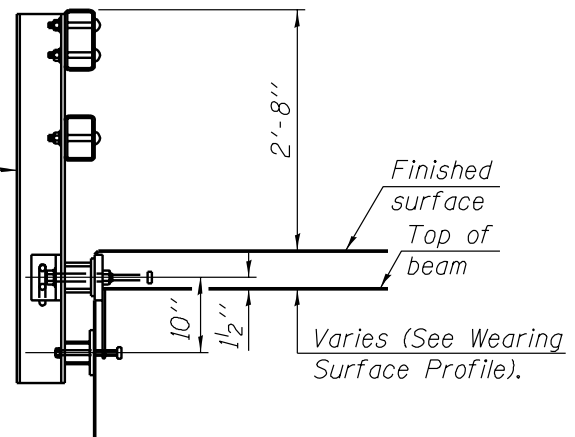


REINFORCED CONCRETE WEARING SURFACE PROFILE

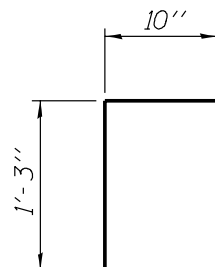
Y = the profile grade minus the top of beam elevation. The seat elevations are based on the geometry of the structure and the expected camber of the beam (see appendix). A minimum concrete wearing surface thickness of 5" is required at all locations. The designer will typically need to provide a "Reinforced Concrete Wearing Surface Profile" along the centerline of structure, the exterior edge of both fascia beams and the stage construction line.



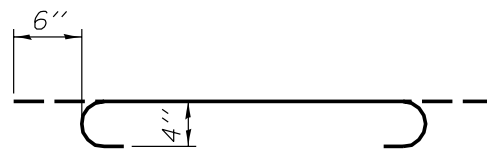
SECTION A-A



SECTION AT RAIL POST



D(E) BAR



d(E) BAR

**REINFORCED CONCRETE
WEARING SURFACE AND
RAILING CONNECTION DETAILS**

Figure 2.3.29